

Infections of the median raphe of the penis

Report of three cases

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Infection of the median raphe is usually seen by the venereologist, but it is a rare condition so that the opportunities for one person to study many cases are limited. Bernfeld (1961) reviewed the literature dating back to 1895; many of the papers he recorded dealt with gonococcal infections of the median raphe, few with the histology and embryology, fewer still with non-gonococcal infection, and none specifically with *Trichomonas vaginalis* infection.

The purpose of this paper is to present three cases of median raphe infection; of gonococcal, trichomonal, and non-specific origin respectively. The aetiology, diagnosis, management, and embryological implications of the ducts, sinuses, and tracts are discussed.

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Case reports

Case 1, a 26-year-old labourer, who had been married for 5 years, reported at the Institute of Venereology on September 6, 1971, complaining of a white urethral discharge of 1 month's duration and a gradually increasing swelling on the penis for 2 weeks. The symptoms started 10 days after an unprotected extramarital exposure. There was no history of previous venereal disease.

Examination

A globular soft boggy mass was protruding ventrally through the prepuce. On retraction of the prepuce, the swelling was seen to extend from the distal part of the penile raphe to about 1 cm. beyond the middle of the shaft (Fig. 1a, b). It was not adherent to the neighbouring structures. Pus could be expressed from a small opening at the distal end. A purulent urethral discharge was also present. Tyson's glands were normal.

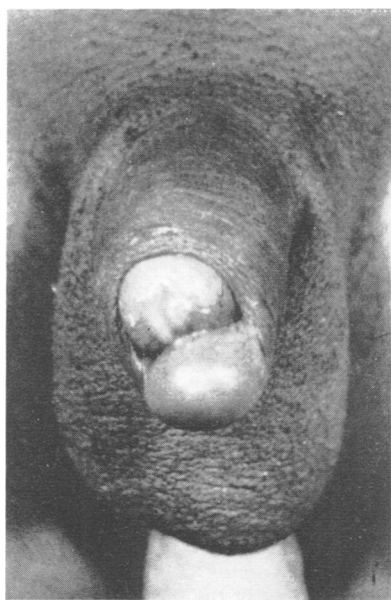


FIG. 1 Case 1

(a) Soft boggy mass protruding ventrally through prepuce



(b) Large pocket of pus over lower part of raphe

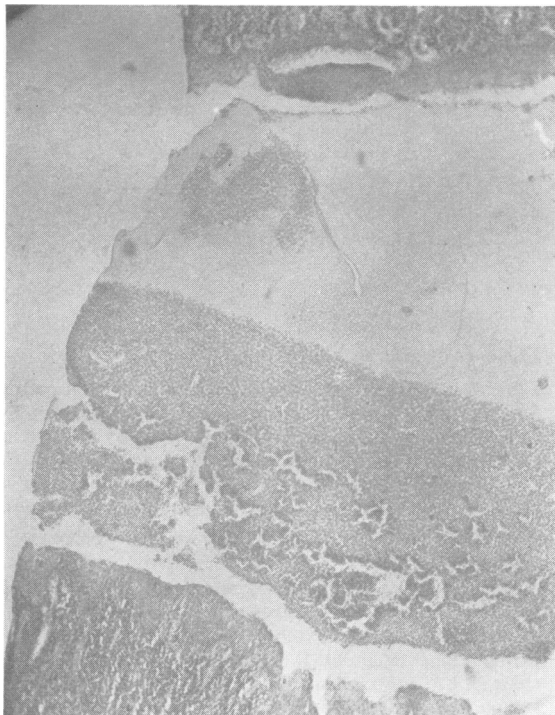


FIG. 1

(c) Opening into sinus, showing stratified epithelium on either side with exudate in the middle. $\times 90$

Investigations and treatment

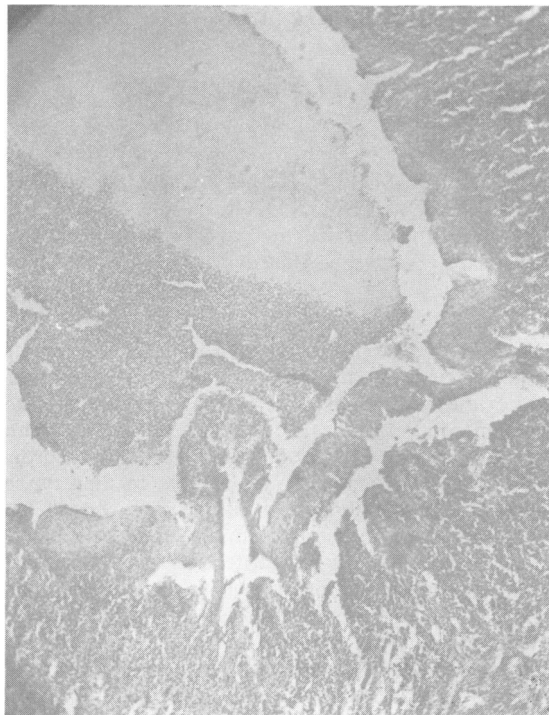
The urethral discharge and pus from the swelling revealed *Neisseria gonorrhoeae* in Gram-stained smears and in culture. A wet preparation and culture of the pus did not reveal *Trichomonas vaginalis* or any other organisms. The blood VDRL slide test was non-reactive. When a thin probe was passed through the opening in the swelling, it extended from the fraenal end for about 3 cm. within the median raphe of the penis.

The patient was given an injection of 1.2 m.u. penicillin, and circumcision with excision of the mass and the tract was carried out. The tract was laid open longitudinally and cleaned. The inner surface of the tract was smooth and glistening and it appeared to be a single tract with one opening. The patient was clinically and bacteriologically normal within 10 days.

The gonococcus was isolated from the wife's cervix, and a wet smear and culture for *T. vaginalis* were negative. She was treated with penicillin and both partners had negative tests 6 months later.

Histopathological examination

The tissue was stained with haematoxylin and eosin. A canal was lined by stratified squamous epithelium and filled with an exudate containing eosin-stained material, numerous degenerate pus cells, and red blood



(d) End of sinus tract. $\times 90$

cells. Below the stratified epithelium there was a dense inflammatory reaction consisting of degenerated polymorphs, thin-walled blood vessels, and extravasated red blood cells (Fig. 1c, d).

Case 2, a 35-year-old mechanic, who had been married for 8 years, reported at the Institute of Venereology on June 17, 1971, complaining of a swelling on the penis which had been discharging pus for 3 months. The condition had started about 2 months after an unprotected exposure to risk of infection and the patient had had no treatment. There was no history of previous venereal disease.

Examination

There was no urethral discharge. Two small hour-glass shaped soft swellings communicating with each other, 5 mm. in diameter, were present in the median raphe over the middle of the shaft. There was a prominent ridge from the swelling to the root of the penis. The distal swelling had a small opening through which a probe could be passed for about 2.5 cm. (Fig. 2a, c, d, opposite).

The opening was enlarged and a thick yellowish frothy pus exuded. The urethra, prostate, and seminal vesicles were normal.

Investigations and treatment

Wet film and culture of the pus from the sinus revealed *Trichomonas vaginalis*. The urine showed no abnormality either macroscopically or microscopically. Cultures of the urine and the discharge from the sinus were negative

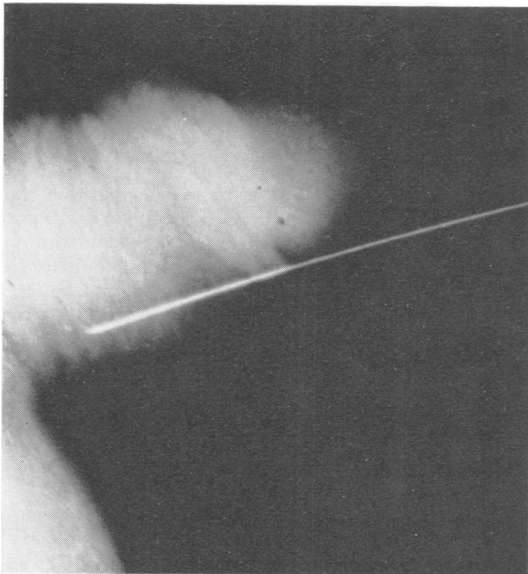
FIG. 2 Case 2



(a) Hour-glass shaped swelling in median raphe and prominent median ridge



(b) Part of canal, showing squamous epithelium, irregular acanthosis, and collections of cells in the subcutaneous tissue. $\times 160$



(c) Radiograph, showing probe passed into tract



(d) Radiograph taken after injection of dye, showing extent of tract

for *N. gonorrhoeae*. Examination of the prostatic fluid and scrapings from the urethra failed to reveal *Trichomonas vaginalis*.

The VDRL slide test was non-reactive. A radiograph taken with the probe in the sinus showed that the tract was 2.5 cm. long. Dye injected into the tract also confirmed the presence of this abnormality (Fig. 2*c, d*). Circumcision was performed and the tract was excised. It was laid open longitudinally and was found to be about 4 cm. long. The inner surface of the tract was smooth with a punctum in the middle.

Investigation of the patient's wife disclosed the presence of *T. vaginalis* vaginitis. There was no evidence of gonococcal or other infection.

These findings led to a diagnosis of trichomonal infection of the median raphe. Both partners were given metronidazole 200 mg. three times a day for 7 days simultaneously. One week after therapy and 6 months later they were both found to be clinically and bacteriologically normal.

Histopathological examination

Tissues stained with haematoxylin and eosin showed the canal to be lined with squamous epithelium with irregular acanthosis and collections of lymphocytes, polymorphs, and round cells in the subcutaneous tissue (Fig. 2*b*).

Case 3, a 25-year-old unmarried labourer, reported at the Institute of Venereology on April 2, 1971, complaining of early morning discharge and a swelling on the ventral aspect of the mid-shaft for 5 weeks, and pain at this site for 1 week. There was no previous history of venereal disease.

The patient admitted an unprotected exposure to risk of infection 12 weeks earlier, and said that he had developed a white urethral discharge and burning on micturition 6 days after this. He had consulted a private practitioner who gave him four intramuscular injections, the nature of which was not known to the patient, and the discharge had subsided. He had then been free from symptoms for about 2 weeks but again developed urethral discharge. Another private practitioner gave him a course of twelve capsules, and the discharge became scanty and was eventually present only in the early mornings. He then noticed the swelling on the mid-shaft.

Examination

There was slight mucopurulent urethral discharge on milking the urethra. The urine was hazy with threads. An elongated, superficial, painful firm mass was present ventrally in the middle of the shaft of the penis with a prominent thickened median raphe above and below the swelling. There was a minute opening discharging pus over the proximal end of the swelling. Tender inguinal lymph nodes were palpable on the left side. The prostate gland was not enlarged or tender.

Investigations

Discharge from the urethra and swelling, urinary sediment, and prostatic fluid showed no gonococci, *Trichomonas vaginalis*, or other specific organism by smear or by culture; however, there were Gram-positive cocci in bunches and chains and Gram-positive and negative

bacilli. The prostatic fluid also revealed many pus cells and similar organisms indicative of prostatitis. A blood VDRL slide test was non-reactive.

Management and histopathology

The mass was excised and sectioned. The naked eye appearance was not suggestive of median raphe abnormality because the canal could not be made out by a probe (Fig. 3*a*).

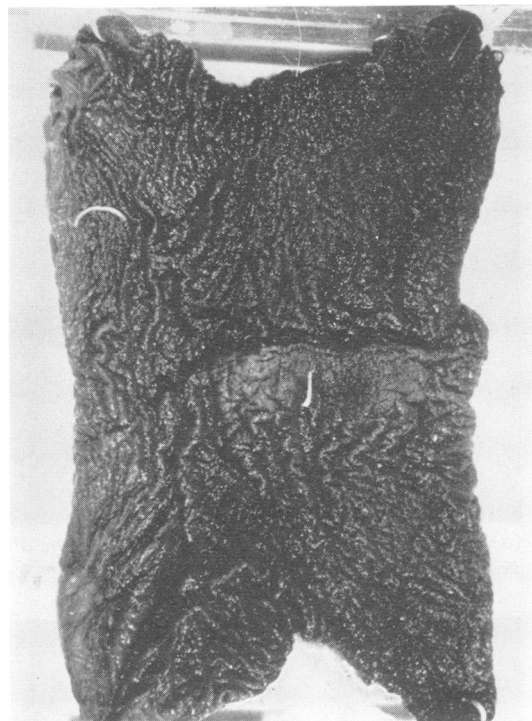


FIG. 3 Case 3

(a) Excised tract along with part of prepuce

On the other hand, a histopathological section stained with haematoxylin and eosin revealed that a small portion of the canal was lined with squamous epithelium and surrounded by dense infiltration with inflammatory cells suggestive of a chronic infection (Fig. 3*b*, opposite), and median raphe infection, urethritis, and prostatitis due to nongonococcal infection was diagnosed. An injection of 1 g. streptomycin was given daily for 5 days, with sulphadiazine tablets 1 g. three times a day for 7 days, and an alkaline mixture. Prostatic massage was carried out weekly for 5 weeks. After 3 months the patient was clinically and bacteriologically normal.

Discussion

Infection of the median raphe is an interesting clinical condition because of its embryological background and its rarity. Defects in the median raphe are the result of the failure of the fusion



FIG. 3 (b) Marked acanthosis with inflammatory subepidermal cells and oedema in dermis. $\times 160$

mechanisms of the ventral wall of the abdomen at the caudal end (Fig. 4). Such failures of fusion of the ventral wall may occur anywhere from the symphysis menti to the anal margin, which is embryologically from the stomodaeum to the cloaca. The deficiency in closure may be manifest in the symphysis menti as split mandible, in the ventral line of the neck as sinuses or cysts, in the thorax as bifid sternum, in the supra-umbilical portion of the abdomen as divarication of the recti, and in the infra-umbilical region of the abdomen as extroversion of the bladder. Varying degrees of malformation, such as epispadias, open penile urethra delineated below by a crescentic glans and preputial fold or even as two genital tubercles with widening of the pubic bones, can occur in the anatomical perineum.

A minor degree of deficient ventral wall closure of the median raphe in the peno-scrotal region and perineum can also occur as minute multiple openings which may occasionally become infected and inflamed (Neff, 1936). In addition, there may be congenital cysts in the peno-scrotal or perineal raphe; they represent remnants of primitive epithelial rests that persist because of incomplete closure of ventral

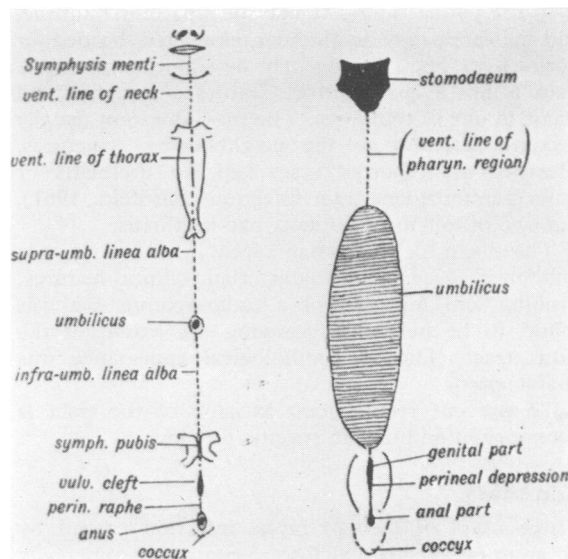


FIG. 4 Diagram comparing median ventral line of adult with that of a 4-week embryo (From Keith, 'Human Embryology and Morphology', 1948, p. 578, figs 511 and 512). Reproduced with the permission of the author, of the publishers, Messrs Edward Arnold, London, and of C. D. Gillies (Fig. 511)

folds (Hamm and Weinberg, 1962). A more serious form in the peno-scrotal region is an actual deficiency of the median raphe. Of all these abnormalities of ventral wall closure, those concerned with the median raphe generally merit attention only if they become infected, especially when infection is acquired venereally or transmitted to the sexual partner. Sometimes, in spite of the infection, the condition may go unnoticed because it tends to be mild and painless.

The type of epithelium lining the canal, tract, or sinus is also of embryological significance (Jadassohn, 1890, 1894; Möller, 1904; Neff, 1936). A predominantly squamous epithelium denotes derivation from an ectodermal source. When there is an endodermal contribution, other epithelial linings, such as the columnar or even the transitional type, may be met with (Neff, 1936).

The aetiological agents which may be responsible for infection are many, the commonest being *Neisseria gonorrhoeae*. Rajam and Rao (1949) and Rajam, Rao, and Rangiah (1953) reported several cases of gonococcal median raphe infection. However, other organisms, including *Trichomonas vaginalis*, may also be responsible.

Infection of the raphe may occur anywhere from the fraenum to the anus, but the commonest site

is in the penile raphe. It may be single or multiple, and the shape may be globular, elongated, beaded, or hour-glass. The opening may be single or multiple. Pain is not a characteristic feature although it did occur in one of our cases. The mass does not usually become adherent to the neighbouring structures. Most of the reported cases had no urethritis or other genitourinary tract infection (Bernfeld, 1961), but two of our three patients had urethritis.

The diagnosis of median raphe infection was not difficult because of the characteristic clinical features. Probing and injection of a radio-opaque dye was found to be helpful in gauging the extent of the sinus tract. The histopathological appearance was characteristic.

To prevent recurrences, excision of the tract is necessary in addition to specific therapy.

Summary

Three cases of median raphe infection caused by different organisms which were contracted venereally are presented. Two patients also had urethritis. The clinical and histopathological appearances were typical. Management consisted of appropriate specific therapy plus excision.

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Infections du raphé médian de la verge. Présentation de trois cas

SOMMAIRE

3 cas d'infections du raphé médian occasionnées par divers organismes et contractées par voie vénérienne sont rapportés. Deux malades avaient aussi une uréthrite. L'aspect clinique et histo-pathologique était typique. Le traitement a associé l'excision à une thérapeutique spécifique appropriée.